THE INFLUENCE OF DESCRIPTIVE AND SOCIAL NORMS IN THE ACCEPTANCE AND USE OF ONLINE FORMATIVE FEEDBACK IN AN UNDERGRADUATE MODULE

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ABSTRACT

Most recently, traditional universities have offered online degree courses which have been characterised by high attrition rates. In this study, students were provided with individualized online formative feedback with the aim to improve the quality of their learning. The importance of *social influence* (descriptive and social norms) in the acceptance and use of feedback in an undergraduate online module was investigated through a survey based on the *social construct* of the modified Unified Theory of Acceptance and the Use of Technology (UTAUT2). Survey data from two cohorts of students were examined using exploratory factor analysis to validate the questionnaire items and regression analysis to build a one factor predictive model. Parametric analyses showed that both descriptive and social norms were important components of *social influence* in the acceptance and use of formative feedback in an online course.

Keywords: Social influence, social norms, descriptive norms, UTAUT2, formative feedback

INTRODUCTION

Many traditional universities now offer online degree courses. These courses are characterized by high dropout rates (Moore & Greenland, 2017). For example, attrition rates exceeding 20% have been observed across Australian open-access online degree units (Greenland & Moore, 2014). Students have also complained about lack of individualised formative feedback (Bates, 2014). Formative assessment feedback includes evidence generated from formative assessments that is used to improve the quality of learning (Black, Buoncristiani & William, 2014). Formative assessment feedback is widely recognized as one of the most powerful influences on student learning (Hattie, Gan & Brooks, 2016; Hattie, 2013; Hattie & Yates, 2013). The Department of Science and Technology Education in the Faculty of Education at the University of Johannesburg recently transitioned one of its undergraduate modules in the Bachelor of Education (BEd) degree from traditional face-to-face learning, into a fully online module with the inclusion of individualized formative assessment feedback. Previous studies have indicated that students do not use and accept formative feedback easily (Panadero & Jonsson, 2013), and some find the lack of personalised feedback frustrating (Soden, 2017; Goto, Batchelor & Lautenbach, 2015). Not much is written about whether *social influence* (interactions on discussion boards, wikis, blogs etc.) affect students' acceptance and use of formative feedback, and little is known about the importance of both components of *social influence* (social and descriptive norms) in the acceptance and use of formative feedback. For this reason, the question that guides this study is: How does *social influence* (descriptive and social norms) affect pre-service teachers' decisions in an undergraduate online module to accept and use formative assessment feedback during authentic tasks?

THEORETICAL BACKGROUND

Social influence is only one of the factors that drives the acceptance and use of technology in many UTAUT2 studies (El-Masri & Tarhini, 2017; Huang & Kao, 2015; Venkatesh, Thong & Xu, 2012). Social influence includes both social and descriptive norms (El-Masri & Tarhini, 2017; Rivis & Sheeran, 2003). Social norms refer to what significant others think the person ought to do (Ham, Jeger & Frajman, 2015; Al-Swidi, Mohammed Rafiul Huque, Haroon Hafeez, & Noor Mohd Shariff, 2014). Descriptive norms refer to the behaviour of the significant other that motivates them to perform a certain behaviour (De Leeuw, Valois, Ajzen & Schmidt, 2015) and refers to activities of others, which may be totally different to the social norms or to what the significant other thinks.

Several authors have reported that social influence has been measured incorrectly in UTAUT2 studies (El-Masri & Tarhini, 2017; Yuan, Ma, Kanthawala & Peng, 2015). They have been measuring, to a large extent, the social norms component, and to a lesser extent, the descriptive

norms (Ham et al., 2015) thus rendering the overall influence of social influence inaccurate. Social norms have been influential in the acceptance and use of technology in collectivist (Eastern) rather than individualistic (Western) cultures (El-Masri & Tarhini, 2017, Huang & Kao, 2015; Xu, 2014; Yang, 2013; Venkatesh et al, 2012;). Social influence is also reported to have a more significant effect on women than men, in the acceptance of technology (Yu, 2012). In addition, Venkatesh et al. (2003) suggest that social influences are moderated by age and have a noticeable effect on older people particularly women. Age also influence social influence - the lower the age the more the social influence, decreasing with age (Rivis & Sheeran, 2003). One study on online games, however, reported that user experience and age did not have moderating effects on social influence (Xu, 2014). The non-significance of user experience follows from the fact that with more experience, the effect of social influences diminishes (Venkatesh et al., 2003; Venkatesh & Morris 2000). Accordingly, in this study, social influence is seen as the degree to which a student believes he or she should use formative feedback, based on the opinions of others. The moderators used in this study for social influence are age, place, frequency of accessing the online module, and time spent applying feedback per assignment.

METHODOLOGY

A quantitative, non-experimental and correlational study was undertaken. 214 third year BEd students in the 2017 cohort, and 175 students in the 2018 cohort took part in the study. Students were provided with individualized online formative feedback by six experienced tutors and two lecturing staff over one semester. A questionnaire was adapted from the UTAUT2 social influence (SI) and behavioural intention (BI) constructs. To ensure construct validity, two experienced academics checked and reworded the original UTAUT2 questionnaire to fit the formative feedback context. Respondents provided answers to each item on a Likert-type agreement scale (7 point), starting from 1 (strongly disagree) to 7(strongly agree).

The first four items in cohort one on *social influence* included: I shared some of my formative assessment feedback with my peer(s); My peer(s) found formative assessment useful; There was a culture of sharing amongst peers regarding formative assessment feedback; My peer(s) shared some of their formative assessment feedback with me. Two more items were added for cohort two, namely: Most of my peers who are important to me are using formative assessment feedback; and, My close friends/peers are always using formative assessment feedback.

Items related to *behavioural intention* included: I will look out for formative assessment feedback in all future studies; I intend to use formative assessment feedback regularly in all my studies; and, I will use lessons learnt from formative assessment feedback in all my future studies

Exploratory factor analysis (EFA) was used to validate the questionnaire items. Based on the EFA results, the convergent validity, discriminant validity and the reliability of all the multiple-item scales were analysed. The measurement properties are reported in the following sections

Reliability: Sampling adequacy

The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was determined to check whether the sample size was huge enough for factor analysis to be done, hence making it possible to extract factors during factor analysis (Somashekhar, Raju & Patil, 2016). The resulting Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for social influence was 0.781 for the 2017 cohort and 0.849 for the 2018 cohort. Both values are greater than 0.5 thus indicating that the items had good sampling adequacy. In addition, Bartlett's Test of Sphericity was statistically significant ($p<0.05$) thus indicating the suitability of the collected data for factor analysis (Hair, Black, Babin, Anderson, Tatham, 2006).

Reliability was assessed using Cronbach's Alpha, composite reliability, and inter-item total correlation which are associated with internal consistency of results. The Cronbach's Alpha for Social influence and behavioural intention for the 2017 and 2018 cohorts were both greater than 0.7 indicating adequate construct reliability (Brown & Moore, 2012). Composite reliabilities values for both cohorts were greater or equal to 0.7 thus rendering the results acceptable (Fornell & Larcker 1981). Inter-item total correlations have factor loadings greater than 0.5 which are acceptable cut-off points (Cristobal, Flavian & Guinaliu, 2007). The composite reliability and

Average Extracted Variance (AVE) for both cohorts of students exceed the 0.70 and 0.5 thresholds respectively thus indicating that the items had convergent validity (Hair et al., 2006), and thus good construct validity. Construct validity refers to the degree to which a test instrument measures the intended construct and is made up of convergent and discriminant validity.

Discriminant validity was assessed by comparing the AVE of each individual construct with corrected item-total correlation coefficients squared for each individual construct. The AVEs were larger than their corresponding corrected item-total correlation coefficients squared for social Influence and behavioural intention, thus indicating adequate discriminant validity (see Hair, et al., 2006).

RESULTS AND DISCUSSION

In this section the variation of *social influence* with biographic information (gender, age, place, and frequency of accessing the online module and time spent applying feedback per assignment are discussed. It is important to note that the adapted social influence question items used in the 2017 cohort measured *social norms* only and the adapted social influence question items used in the 2018 cohort measured both *descriptive norms* and *social norms.*

The variation of Social Influence across categories of gender.

To examine differences in *social influence* **(**social norms) for the 2017 cohort, between males and females, an independent samples t-test indicated that there was no significant difference in social influence between males and females, t (212) = 1.405, p =.161

For the 2018 cohort the descriptive statistics and an independent t-test were conducted to check the effect of gender on *social influence* (descriptive and social norms). The *social influence* mean for males was greater than for females.

The independent samples t-test indicated that there is a significant difference in *social influence* **(**descriptive and social norms) between males and females, t(173)= -2.254, p =**.025.** Also females had lower mean *social influence scores* (M = 30.22; SD = 8.183) than males (M = 32.84; SD = 6.766). This finding is not consistent with prior research (Yu, 2012; Venkatesh, et al., 2003; Venkatesh & Morris, 2000; Morris & Venkatesh, 2000) where social influence was stronger in women than men.

The variation of Social Influence with age

The distribution of *social influence* **(**social norms), across categories of age did not have any statistically significance for the 2017 cohort. This was confirmed after running the Kruskal-Wallis test, (p = 0.646; p>0.5). An analysis of variance for the 2018 cohort showed that the effect of *social influence* (descriptive and social norms) on age groups was significant, [F (3, 171) = 2.938, p = .035].

Post hoc comparisons using the Games-Howell test indicated that the mean *social Influence* (descriptive and social norms) score for the above 30 age group (M = 35.75, SD = 2.062) was significantly different from the 18 - 21 age group (M = 29.31, SD = 7.964). However, the 22 – 25 age group (M = 32.01, SD = 7.523), and the 26 - 29 age group (M = 34.54, SD = 6.802) did not significantly differ from the other age groups. The fact that social influence was greater for old students above 30 is consistent with prior research (Venkatesh, et al 2003; Venkatesh & Morris, 2000; Morris & Venkatesh, 2000). This may be indicative of older people needing help from significant others in the early stages of technology acceptance (formative feedback in this case).

The variation of social influence, place, and frequency of accessing the online module

A Kruskal-Wallis test conducted to evaluate differences in the distribution of *social influence* (social norms) across categories of place and frequency of accessing the online module for the 2017 cohort indicated that there is no statistical significance, p = 0.333, p < 0.05.

For the 2018 cohort the descriptive statics and a one-way between subjects' ANOVA test were conducted to check the effect of categories of place and frequency of accessing the online module on *social influence* (descriptive and social norms).

A one-way between subjects' ANOVA test for the 2018 cohort indicated that there was statistical significant differences for *social influence* (descriptive and social norms) across categories of place and frequency of accessing the online module, [F (5, 169) = 2.301, p = **.047**].

Post hoc comparisons using the Gabriel test indicated that the mean of those students who accessed the module, 80% on-Campus and 20% off-Campus (M = 33.14, SD = 6.174) was significantly different to those who accessed the module 20% on-Campus and 80% off-Campus (M = 26.00, SD = 9.143). However, other categories of place and frequency of accessing the online module did not significantly differ between the groups. The post hoc results suggest that social interaction would take place mostly on campus where there was unlimited connectivity as compared to off-campus.

Variation of Social Influence and time spent applying feedback per assignment

A one-way between subjects' ANOVA conducted to evaluate the distribution of social influence (social norms) on effect of time spent applying feedback per assignment for the 2017 cohort indicated that there was no significant effect of social influence on time spent applying feedback per assignment at the p<.05 level, [F (5, 208) = 1.240, p = .291]

For the 2018 cohort the descriptive statics and a one-way between subjects' ANOVA test were conducted to check the effect of *social influence* (descriptive and social norms) on categories of time spent applying feedback per assignment. Table 1 shows the descriptive statistics of time spent on assignment.

Table 1: Descriptive statistics: Time spent per assignment

Descriptives								
TSI								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0 minutes	5	23.20	5.541	2.478	16.32	30.08	16	30
1 t0 30 minutes	49	28.94	9.001	1.286	26.35	31.52	7	42
31 to 60 minutes	64	32.81	5.874	.734	31.35	34.28	19	42
61 to 90 minutes	35	30.60	8.809	1.489	27.57	33.63	8	42
91 to 120 minutes	13	35.92	4.681	1.298	33.09	38.75	23	41
more than 120 minutes	9	34.78	3.032	1.011	32.45	37.11	32	40
Total	175	31.34	7.698	.582	30.19	32.49	7	42

For the 2018 cohort, assuming for unequal homogeneity of variance of social influence (descriptive and social norms), two robust tests for equality the, Welch and the Brown-Forsythe tests indicated statistical significance for social influence, ($p < 0.05$) on time spent on assignment, $F(5, 27.809 = 6.493$, $p< 0.00$; $F(5, 88.325= 5.724$, $p < 0.00$.

Post hoc comparisons using the Tukey HSD test indicated that the mean *social influence* score for the students who did not spent time on their feedback assignment (M = 23.20, SD = 5.541) was significantly different to those who took more than 120 minutes (M = 34.78, SD = 3.032). The mean social influence score for students who took between 1 to 31 minutes (M = 28.94, SD = 9.001) was significantly different to those students who took 91 minutes to 120 minutes (35.92, SD = 4.681) and more than 120 minutes (M = 34.78, SD = 3.032). Student who spent more time on assignments had had higher social influence scores and thus engaged more socially unlike those who took less time on assignment.

Regression model

The one predictor regression was used to determine whether social influence was an antecedent for behavioural intention to use formative feedback for both the 2017 and 2018 cohort. For the 2017 cohort, the result indicates that the *social influence* (social norms) predictor was **statistically insignificant** (t= -.824, **p** = **.411**, p> 0.05). The variation inflation factor less than 5 indicating that there was no multi-collinearity in the data.

For the 2018 cohort, the results indicated that descriptive and social norms predictors were **statistically significant** (t= -2.264**, p = .025**, p<0.05). The variation inflation factor, less than 5, indicates that there was no multi-collinearity in the data.

For the 2018 regression model, the coefficient of social influence is negative meaning that social influence and behavioural intention are inversely related. This is consistent with prior research because according to Venkatesh, et al. (2003) social influence decreases with experience (the students obviously had some formative feedback experience in their college lives). The significance of both descriptive and social norms predictor result probably follows from the fact that South Africa is not a collectivist culture where the social norms predictor would result in a significant result but rather an individualistic culture where both social and descriptive norms are significant predictors (El-Masri & Tarhini, 2017, Huang & Kao, 2015; Xu, 2014; Yang, 2013).

CONCLUSION

The validation of the instrument indicated that the adapted UTAUT2 scale is accurate and reliable.

It is evident that social influence has a significant effect on behavioural intention to use formative feedback, only when **both** the descriptive and social norms are. This result is consistent with Ham et al., (2015). Both descriptive and social norms are precursors of behavioural intention in this case to use formative feedback. The implication of this finding is that it is important to take note of what significant others actually do and think about the acceptance and use of formative feedback. Instructional designers and course facilitators need to use social tools like blogs, discussion boards and wikis to improve the acceptance and use of formative feedback. Besides using these tools, facilitators must encourage modelling of behaviour by the students during tool use so as encourage the use of descriptive norms.

In future studies, a similar study needs to be repeated to confirm this finding. In addition, qualitative studies need to be done to determine experiences around the nature of interactions among the students engaging with the formative feedback. In addition, the use of second-generation methods of data analysis, including Structural Equation Modelling (SEM) is recommended.

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